REMARKS

Reconsideration of this application is respectfully requested in view of the following remarks.

Claims 1-28 were pending in this Application. In the Office Action:

- Claims 21-28 were rejected under 35 U.S.C. § 101 because, according to the Office Action, the claimed invention is directed to non-statutory subject matter;
- Claims 21-28 were indicated to recite allowable subject matter if the issues outlined with respect to the rejection under 35 U.S.C. § 101 were resolved by way of amendment; and
- Claims 1-20 were allowed.

Applicant thanks the Examiner for the indication of allowable subject matter and the indication of allowed claims. For at least the following reasons, it is respectfully submitted that, without amendment, the issues under 35 U.S.C. § 101 are resolved. This application therefore is condition for allowance.

Rejection of Claims 21-28 Under 35 U.S.C. § 101

Claims 21-28 were rejected under 35 U.S.C. § 101 purportedly because the claimed invention is directed to non-statutory subject matter.

According to the Office Action:

> Merely measuring an amplitude of an order of diffraction would not appear to be sufficient to constitute a tangible result, since the outcome of the measuring step has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized. See OG Notices: 22 November 2005, "Interim

> Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility."
>
> See part b. *Practical Application [that] Produces a Useful, Concrete, and Tangible Result* under Section IV *Determine Whether the Claimed Invention Complies with the Subject Matter Eligibility Requirement of 35 U.S.C. Sec. 101*, sentence 3, in the OG Notice from 22 November 2005 states "[i]n determining whether the claim is for a 'practical application,' the focus is not on whether the steps taken to achieve a particular result are useful, tangible, and concrete, but rather that the final result achieved by the claimed invention is 'useful, tangible, and concrete.'"

The rejection is respectfully traversed. Claim 21, as originally filed, recites a useful method for measurement. The method comprises illuminating a first object having at least a first pattern, projecting an image of the first pattern onto a second object having a second pattern corresponding to the first pattern, and measuring an amplitude of at least one order of a diffraction pattern resulting from interference between the second pattern and the projected image. Claims 22-28 depend from claim 21.

Claims 21-28 satisfy the test for subject matter eligibility, for among other reasons, because the recited measurement (i.e., of an "amplitude of at least one order of a diffraction pattern resulting from interference between the second pattern and the projected image) indeed provides a useful, tangible, and concrete result. Indications that the result is useful, concrete, and tangible can be found in the dependent claims and in the specification and therefore have been disclosed.

For example, claim 23 recites an implementation in which a patterning structure and/or a substrate is (are) positioned based on the measured amplitude. Claim 27 recites another implementation in which an overlay measurement calibration is performed based on a relation

between the measured amplitude and a corresponding relative displacement of the first pattern and the second pattern. These claims therefore disclose exemplary, concrete and tangible uses for the recited amplitude measurement.

The specification discloses the following additional uses based on exemplary implementations:

According to Paragraphs [00066] to [00068], a photo detector 415 may be arranged to sense changes in the amplitude of one or more of the diffraction orders of the diffraction patterns 417 and, as a result, may provide a direct measure of the overlay error. Hence, synchronization with the actual (wafer and reticle) stage positions may not be required.

According to Paragraph [000137]:

> It appears to be a general phenomenon that the even orders show a large modulation depth, while the uneven orders show a much smaller modulation depth. This effect can be exploited, because a reflected beam having a small sensitivity for position variations can be used as a reference beam. Because such a beam may depend on dose variations in the illuminating light, on wafer reflectivity variations, and on other disturbing factors, **changes in its amplitude could be used to correct the actual measurement beam (e.g. the 2nd order). Such a technique may be especially useful in an on-the-fly measurement scheme,** because principally a zero overlay error may result in a constant measured beam amplitude. **Any deviation in the measured amplitude may then be interpreted as a position change (overlay error).** The availability of a beam that is independent of the relative position, but can act as a measure for any disturbances, may therefore help in **creating an accurate measurement of the relative position.** (emphasis added)

Paragraph [000146] states:

> Some orders are substantially independent on the relative position, while others are very much dependent. **An amplitude of one or more of the position-independent diffraction orders can**

> **be sensed** by a photo detector, **in addition to an amplitude of one or more of the position-dependent orders. The output** of the photo detector that senses the position-dependent order (in the example in the previous chapter, this was the 2nd order) **can be corrected by the amplitude measured by** the photo detector **sensing the position-independent diffraction order** (in the example, this was the 1st order). **In such manner, the method can be made insensitive to variations in illumination dose, wafer reflectivity, and so on.** The two photo detectors used could either be placed on the same side of the wafer grating (i.e. measuring the +1st and +2nd orders), or on opposite sides of the grating (i.e. measuring the +1st and –2nd orders), depending on available space in the machine. It could also be decided to measure both the +1 and –1, and +2 and –2 orders, e.g. **to create a more accurate measurement signal.** (emphasis added)

The specification and claims therefore disclose several useful, concrete, and tangible results that can be obtained from measuring the recited "amplitude . . ." The outcome of the measuring step therefore can be used in a disclosed practical application and it has been made available in such a manner that its usefulness in a disclosed practical application can be realized. Although the claims are not limited to the disclosed embodiments and implementations, the recited method clearly constitutes patentable subject matter. Under the Interim Guidelines, it provides at least one useful, concrete, and tangible result. Applicant therefore respectfully requests withdrawal of the rejection under 35 U.S.C. § 101 and allowance of all pending claims.

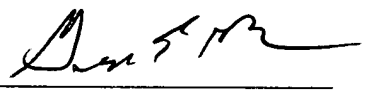
Comments on the Examiner's Statement of Reasons for Allowance

In a Statement of Reasons for Allowance, the Examiner made reference to Applicant's Remarks, filed July 31, 2006, concerning claims 1, 18 and 21. Those remarks, however, are not the only reasons why the claims are allowable. Applicant therefore respectfully traverses the expressed reasons for allowance. It is respectfully submitted that the subject matter of the allowed and allowable claims is patentable for their respective recitations of claimed

combinations as a whole, without any particular criticality or distinguishing feature being attributable to any one or more of such features, and without any narrowing interpretation being imposed on any of such features. Applicant also submits that the dependent claims are allowable not only for their dependence on the allowed independent claims, but also for the additional subject matter recited in each of those dependent claims.

In view of the foregoing, all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone Applicant's undersigned representative at the number listed below.

Date: January 22, 2007

By: 

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